한국동물분류학회지 제8권 제1호
The Korean Journal of Systematic Zoology
Vol. 8, No. 1: 141-160 (June 1, 1992)

A Systematic Study on the Bryozoans from the South Sea in Korea I. Cheilostomata

Sec, Ji Eun
(Department of Biology, Chŏnju Woosuk University, Chŏnbuk 565-800, Republic of Korea)

한국 남해산 태충류의 계통분류학적 연구
I. 순구류

서 지 은
(전주우석대학교 생물학과)

적 요

한국 남해산 태충류의 계통분류학적 연구를 위해 1965년 부터 1991년 까지 남해연안과 여러 도서지방의 49개 지역(Fig. 1)으로부터 채집된 재료들을 동정한 결과 모두 2아목 28과 43속 57종의 순구류가 밝혀졌으며 이 중에서 *Electra tenella, Labioporella bursaria, Dendrobeania longispinosa, Sinupetraliella gigantea, Cryptosula pallasiana, Hippopodina feegeensis* 와 *Eurystomella bilabiata*의 7종은 한국 미기록종이었다.

한국 미기록종과 특기를 요하는 종에 대해서는 기재를 하였고 도판을 작성하였다.

Key words: Systematics, bryozoans, Cheilostomata, South Sea, Korea.

INTRODUCTION

Since Okada (1923) reported forty species from the Korea Strait, a total of 114 species of Cheilostomata

---

This study was supported by Korea Science and Engineering Foundation in 1991. KOSEF 911-0409-077-1

from the South Sea have been recorded so far, as results of systematic studies of Korean bryozoans (Rho & Chung, 1975; Rho & Song, 1980; Rho & Kim, 1981; Rho & Seo, 1984, 1985, 1986, 1988, 1990; Seo & Rho, 1989). However, the study on the distribution in Korean waters is only a work of Rho & Seo (1986).

For the systematic study of Cheilostomata from the South Sea, the materials were collected from 49 localities (Fig. 1) along the coastal lines and islands of the South Sea from 1965 to 1991. The specimens

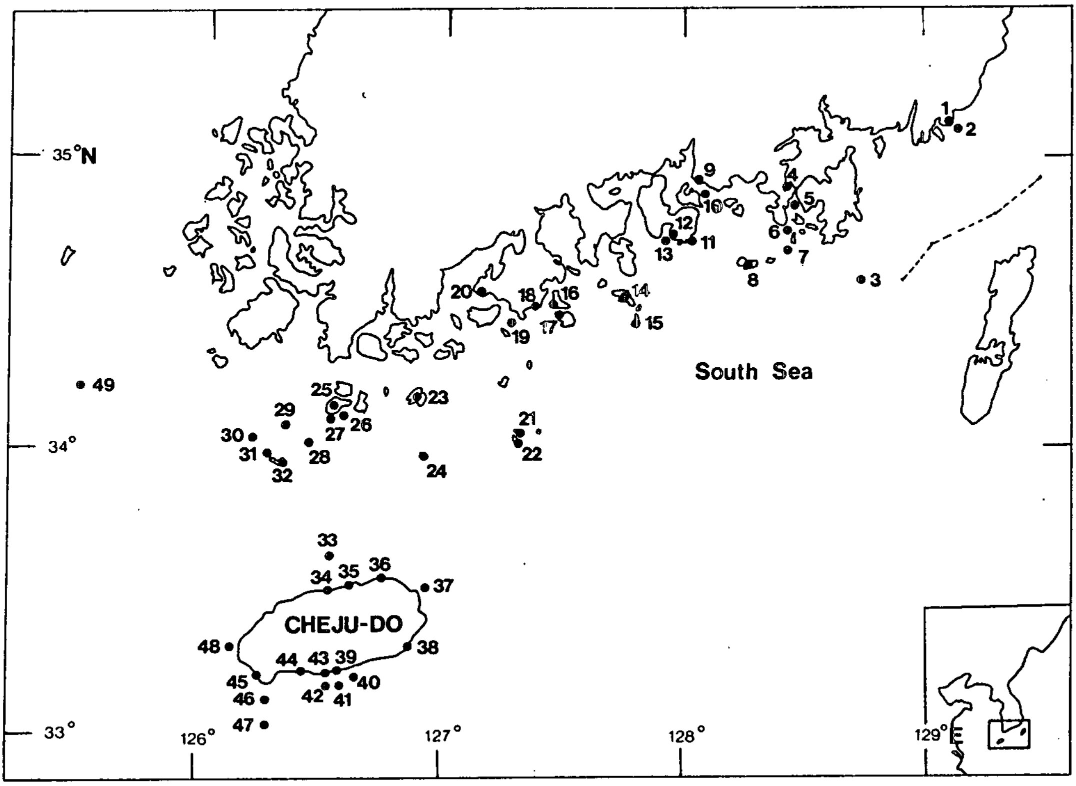


Fig. 1. A map showing the localities where the materials were collected.

1, 미포(Mip'o) ; 2, 오룩도(Orukto) ; 3, 홍도(Hongdo) ; 4, 충무(Ch'ungmu) ; 5, 호도(Hodo) ; 6, 비진도(Pijindo) ; 7, 매물도(Maemuldo) ; 8, 욕지도(Yokjido) ; 9, 삼천포(Samch'ŏnp'o) ; 10, 신수도(Sinsudo) ; 11, 미조리(Mijo-ri) ; 12, 상주리(Sangju-ri) ; 13, 노도(Nodo) ; 14, 금오도(Kŭmodo) ; 15, 소리도(Sorido) ; 16, 봉남(Pongnam) ; 17, 죽정(Chukjŏng) ; 18, 내발(Naebal) ; 19, 지죽도(Chijukto) ; 20, 녹동(Noktong) ; 21, 거문도(Kŏmundo) ; 22, 안노루도(Annorudo) ; 23, 청산도(Ch'ŏngsando) ; 24, 여서도(Yŏsŏdo) ; 25, 보길도(Pogildo) ; 26, 예작도(Yejakto) ; 27, 목도(Mokto) ; 28, 보론섬(Poronsŏm) ; 29, 횡간도(Hoenggando) ; 30, 직구도(Chikkudo) ; 31, 상추자도(Sangch'ujado) ; 32, 추자도(Ch'ujado) ; 33, 관탈도(Kwantaldo) ; 34, 제주항(Chejuhang) ; 35, 삼양 1동 (Samyang 1 dong) ; 36, 김녕(Kimyŏng) ; 37, 우도(Udo) ; 38, 표선(P'yosŏn) ; 39, 서귀포(Sŏgwip'o) ; 40, 숲섬(Supsŏm) ; 41, 문섬(Munsŏm) ; 42, 범섬(Pŏmsŏm) ; 43, 삼매봉(Sammaebong) ; 44, 대포(Taep'o) ; 45, 모슬포(Mosŭlp'o) ; 46, 가파도(Kap'ado) ; 47, 마라도(Marado) ; 48, 차귀도(Ch'agwido) ; 49, 만재도(Manjaedo).

were dyed with borax-carmine dying solution and observed under stereomicroscope, but the close observation was done with scanning electron microscope. As a result, 57 species, 43 genera, 23 families in two suborders of cheilostomatous bryozoans were identified, of which seven species, *Electra tenella, Labioporella bursaria, Dendrobeania longispinosa, Sinupetraliella gigantea, Cryptosula pallasiana, Hippopodina feegeensis* and *Eurystomella bilabiata* were new to Korean fauna.

The systematic scheme of Osburn (1950, 1952) and Harmer (1926, 1957) were consulted in this study.

SYSTEMATIC ACCOUNT

Phylum Bryozoa Ehrenberg, 1831	태형동물 문
Class Gymnolaemata Allman, 1856	나후 강
Order Cheilostomata Busk, 1852	순구 목
Suborder Anasca Levinsen, 1909	무낭 아목
Division Inovicellata Jullien, 1888	육질이끼벌레 군
Family Aeteidae Smitt, 1867	자루이끼벌레 과
Genus *Aetea* Lamouroux, 1812	자루이끼벌레 속

1. *Aetea anguina* (Linnaeus, 1758) 자루이끼벌레

Material examined: Kwantaldo (20m deep), Aug. 19, 1988, other bryozoans (*Caberea lata*).

Division Malacostega Levinsen, 1909	연지붕이끼벌레 군
Family Membraniporidae Busk, 1854	막이끼벌레 과
Genus *Membranipora* de Blainville, 1830	막이끼벌레 속

2. *Membranipora tuberculata* (Bosc, 1802) 관막이끼벌레

Material examined: Sorido (5m deep, subtidal), Aug. 31, 1988 (J.K. Jae), seaweeds: Yokjido (15m deep), Sep. 1, 1988 (J.K. Jae), seaweeds.

Family Electridae d'Orbigny, 1851	엘렉트라이끼벌레 과 (신칭)
Genus *Electra* Lamouroux, 1816	엘렉트라이끼벌레 속(신칭)

3. *Electra tenella (Hincks, 1880) 유연엘렉트라이끼벌레 (신칭) (Pl. 1, Fig. 1)

Electra angulata: Harmer, 1926, p.207, pl. 13, fig. 11; Okada & Mawatari, 1938, p.449; Song, 1985, pp.71,74.

Electra tenella: Marcus, 1937, p.48; Silén, 1941, p.8; Osburn, 1947, p.10; Mawatari, 1952, pp.268, 269, fig. 2; Soule, 1959, p.10.

Material examined: Chukjŏng, July 1, 1991, seaweeds, shell.

Description: Colony encrusting, thin and tender. Zooecia elongate, seperated by shallow grooves. Opesia elongate-oval. Margin of operculum chitinized. Marginal spines usually 4-6 pairs, overarching the frontal membrane. Gymnocyst bearing proximally a pair of strong, vertical and cornical spines, or only one in the zooecia at the bifurcation.

---

*indicates the species new to Korean fauna.

Distribution: Korea (Sea of Japan, South Sea, Yellow Sea); Japan; California Gulf; Sumbawa; Siam; Florida; Caribbean Sea; Brazil; Colombia.

Family Hincksinidae Canu & Bassler, 1927 힌크신이끼벌레 과
Genus *Ellisina* Norman, 1903 엘리시나이끼벌레 속

4. *Ellisina canui* (Sakakura, 1935) 카누이끼벌레

Material examined: Ch'ŏngsando (100m deep), July 26, 1981, rocks.

Family Calloporidae Norman, 1903 단단이끼벌레 과 (신칭)
Genus *Tegella* Levinsen, 1909 거미이끼벌레 속

5. *Tegella incrustans* Silén, 1941 거미이끼벌레

Material examined: Ch'ŏngsando (100m deep), July 26, 1981, rocks.

Division Coilostega Levinsen, 1909 덮게이끼벌레 군
Family Steganoporellidae Smitt, 1873 단추이끼벌레 과
Genus *Steganoporella* Smitt, 1873 단추이끼벌레 속

6. *Steganoporella magnilabris* (Busk, 1854) 큰단추이끼벌레

Material examined: Kwantaldo (25m deep), Aug. 19, 1988 (J.K. Jae); Yŏsŏdo (25m deep), Aug. 25, 1988 (J.K. Jae); Samyang 1 dong (40m deep), Aug. 6, 1991 (C.J. Sim).

Genus *Labioporella* Harmer, 1926 입술이끼벌레 속

7. *Labioporella bursaria (MacGill., 1879) 입술이끼벌레 (신칭) (Pl.1, Figs. 2, 3)

Labioporella bursaria: Harmer, 1926, pp. 285, 286, pl. 21, figs. 12, 13.

Material examined: Kwantaldo (25m deep), Aug. 19, 1988 (J.K. Jae).

Description: Colony encrusting. Zooecia oblong; tube usually unilateral; cryptocyst porous. Avicularia large, with a greatly developed rostral floor; mandible broadly spatulate, wider and toothed distally, two halves of its main sclerite hardly reaching beyond the proximal half and dying away distally.

Distribution: Korea (South Sea); Victoria; Queensland; Port Phillip; Makassar; Celebes.

Family Thalamoporellidae Levinsen, 1909 안방이끼벌레 과
Genus *Thalamoporella* Hincks, 1887 안방이끼벌레 속

8. *Thalamoporella lioticha* (Ortmann, 1890) 미끈안방이끼벌레

Material examined: Mip'o, April 25, 1975, rocks; Pijindo, May 31, 1987 (J. K. Jae); Supsŏm (10m deep), July 14, 1987 (J.W. Lee), seaweeds; Yokjido (20m deep), Sep. 1, 1988 (J.K. Jae), other bryozoans (*Amastigia rudis*).

Division Pseudostega Levinsen, 1909 헛지붕이끼벌레 군
Family Cellariidae Hincks, 1880 마디이끼벌레 과
Genus *Cellaria* Ellis & Solander, 1786 마디이끼벌레 속

9. *Cellaria punctata* (Busk, 1852) 마디이끼벌레

Material examined: Orukto, April 18, 1976 (B.J. Rho), debris; Sangju-ri, May 20, 1981; Maemuldo, July 18, 1984; Hodo, July 19, 1984; Samch'ŏnp'o, July 21, 1984, ascidians; Pijindo (subtidal), May 31, 1987 (J.K. Jae), other bryozoans; Udo, Oct. 8, 1987 (B.J. Rho), seaweeds; Samyang 1 dong (40m deep), Aug. 6, 1991 (C.J. Sim), sponges; Pŏmsŏm, Oct. 22, 1991 (J.I. Song).

Division Cellularina Smitt, 1867 방이끼벌레 군
Family Scrupocellariidae Levinsen, 1909 가시이끼벌레 과
Genus *Scrupocellaria* van Beneden, 1845 가시이끼벌레 속

10. *Scrupocellaria diadema* Busk, 1852 가시이끼벌레

Material examined: Ch'agwido, Oct. 23, 1991 (J.I. Song), sponges.

Genus *Caberea* Lamouroux, 1816 카베레아이끼벌레 속

11. *Caberea boryi* (Audouin, 1826) 보리이끼벌레

Material examined: Pijindo, May 31, 1987 (J.K. Jae); Supsŏm (10m deep), July 14, 1987 (J.W. Lee), debris; Pŏmsŏm, Oct. 22, 1991 (J.I. Song); Ch'agwido, Oct. 23, 1991 (J.I. Song), other bryozoans (*Codonellina montferrandii*); Marado, Oct 25, 1991 (J.I. Song), sponges.

12. *Caberea lata* Busk, 1852 라타이끼벌레

Material examined: Mip'o, May 12, 1974 (B.J. Rho), anthozoans; Ch'ungmu, July 19, 1978 (B.J. Rho); Sangju-ri, Nov. 15, 1980 (J.I. Song), anthozoans; May 24, 1981; Maemuldo, July 18, 1984; Hodo, July 19, 1984; Samch'ŏnp'o, July 20, 21, 22, 23, 1984, ascidians; Supsŏm (10m deep), July 14, 1987 (J.W. Lee), seaweeds root; Kwantaldo (20m deep), Aug. 19, 1988 (J.K. Jae); Manjaedo (20m deep), Aug. 23, 1988 (J.K. Jae); Yokjido (20m deep), Sep. 1, 1988 (J.K. Jae); Sangch'ujado (15m deep), July 22 1990 (J.W. Lee), seaweeds; Hoenggando (intertidal), July 23, 1990 (J.W. Lee); (15m deep), July 25, 1990 (J.W. Lee), seaweeds; Kimyŏng (200m deep), July 15, 1991 (C.J. Sim), other bryozoans (*Fenestrulina mutabilis*); Pŏmsŏm, Oct. 22, 1991 (J.I. Song), shell; Ch'agwido, Oct. 23 (J.I. Song).

13. *Caberea hataii* Okada, 1929 하태이끼벌레

Material examined: Kwantaldo (25m deep), Aug. 19, 1988 (J.K. Jae), other bryozoans.

Genus *Tricellaria* Fleming, 1828 세방가시이끼벌레 속

14. *Tricellaria occidentalis* (Trask, 1857) 세방가시이끼벌레

Material examined: Chukjŏng, July 23, 1982 (J.I. Song); Sanuju-ri, July 14, 1983 (Dept. of Biology, Hannam Univ.); Kŏmundo, May 27, 1987 (J.K. Jae); Yŏsŏdo (deep 5m), Aug. 25, 1988 (J.K. Jae), seaweeds; Sorido (subtidal), Aug. 31, 1988 (J.K. Jae), seaweeds; Chikkudo (5m deep), July 22, 1990 (J.W. Lee), seaweeds; Hoenggando (intertidal), July 23, 1990 (J.W. Lee); Pongnam, July 1, 1991, seaweeds; Chukjŏng, July 1, 1991, seaweeds.

Genus *Amastigia* Busk, 1852 이은이끼벌레 속

15. ***Amastigia rudis*** (Busk, 1852) 막대이은이끼벌레

Material examined: Ch'ujado (20m deep), May 26, 1987 (J.K. Jae), rocks; Pijindo, May 31, 1987 (J.K. Jae); Kwantaldo (5-25m deep), Aug. 23, 1988 (J.K. Jae); Manjaedo (20m deep), Aug. 23, 1988 (J.K. Jae); Yokjido (20m deep), Sep. 1, 1988 (J.K. Jae); Hoenggando (intertidal), July 23, 1990 (J.W. Lee), ascidians.

16. ***Amastigia xishaensis*** Xixing, 1984 볼록이은이끼벌레

Material examined: Munsŏm (3m deep), Dec. 3, 1978 (B.J. Rho); Pŏmsŏm, Oct. 22, 1991 (J.I. Song), sponges.

Family Epistomiidae Gregory, 1903 염주이끼벌레 과
Genus *Synnotum* Pieper, 1881 염주이끼벌레 속

17. ***Synnotum aegyptiacum*** (Audouin, 1826) 염주이끼벌레

Material examined: Chijukto, July 2, 1991, hydrozoans, sponges.

Family Bugulidae Gray, 1848 다발이끼벌레 과
Genus *Bugula* Oken, 1815 다발이끼벌레 속

18. ***Bugula neritina*** (Linné, 1758) 큰다발이끼벌레

Material examined: Chukjŏng, July 1, 1991, seaweeds.

19. ***Bugula dentata*** (Lamouroux, 1816) 치상이끼벌레

Material examined: Maemuldo, July 18, 1984; Kwantaldo (25m deep), Aug. 19, 1988 (J.K. Jae); Mijo-ri, April 27, 1990 (B.J. Rho); Sangch'ujado (15m deep), July 22, 1990 (J.W. Lee), sponges; Hoenggando (intertidal), July 23, 1990 (J.W. Lee), sponges; Hoenggando (15m deep), July 25, 1990.

20. ***Bugula californica*** Robertson, 1905 캘리포니아이끼벌레

Material examined: Chukjŏng, July 1, 1991, seaweeds.

Genus *Caulibugula* Verrill, 1900 줄기다발이끼벌레 속

21. ***Caulibugula occidentalis*** (Robertson, 1905) 줄기다발이끼벌레

Material examined: Chukjŏng, July 23, 1982 (J.I. Song); Naebal, June 30, 1991, rocks; Chijukto, July

2, 1991, sponges.

Genus *Dendrobeania* Levinsen, 1909　수지콩이끼벌레 속

22. Dendrobeania murrayana (Johnston, 1847)　무라이수지콩이끼벌레

Material examined: Ch'ujado (20m deep), May 26, 1987 (J.K. Jae), other bryozoans.

****23. Dendrobeania longispinosa*** (Robertson, 1905)　긴극수지콩이끼벌레　(Pl. 1, Fig. 4)

Beania longispinosa Robertson, 1905, p.277, pl.12, figs. 65, 66.

Dendrobeania longispinosa: Osburn, 1905, p.168, pl.25, figs. 4, 5; Bergy & Denning, 1987, p.424, fig. 21. 51.

Material examined: Ch'ujado (20m deep), May 26, 1987 (J.K. Jae), other bryozoans, rocks.

Description: Colony attaching by rootlets from basal surface, irregular, recumbent. Zooecia arranged alternately, connecting loosely, erect at the distal half, boat-shaped, narrower distally. A pair of long and heavy distal spines, situated close together and point distally, lateral spines, usually 6 pairs, curved over the opesia and so long that they may reach beyond the opposite side of zooecium.

Remarks: Robertson described the species bearing 7-9 pairs, and Osburn recorded 7 pairs, but our specimens have 6 pairs.

Distribution: Korea (South Sea); California; Santa Carolina Island; Anacapa passage.

Family Beaniidae Canu & Bassler, 1927　콩이끼벌레 과
Genus *Beania* Johnston, 1840　콩이끼벌레 속

24. Beania hexaceras (Ortmann, 1890)　육콩이끼벌레　(Pls. 2, 3)

Material examined: Kŏmundo, May 27, 1987 (J.K. Jae); Hongdo (subtidal), June 1, 1987 (J.K. Jae); Kŏmundo (15m deep), July 25, 27, 1988 (B.J. Rho), seaweeds; Kwantaldo, Aug. 19, 1988 (J.K. Jae), seaweeds: Yŏsŏdo, Aug. 25, 1988 (J.K. Jae) Yokjido (10m deep), Sep. 1, 1988 (J.K. Jae); Poronsŏm, July 21, 1990 (J.W. Lee), seaweeds; Sangch'ujado (15m deep), July 22, 1990 (J.W. Lee), seaweeds; Hoenggando (intertidal), July 23, 1990 (J.W. Lee), seaweeds.

Remarks: In the paper of Rho & Seo (1980), *Beania hexaceras* var. *serrata* was included in *B. hexaceras*. In this study, the author could observe the another intermediate forms (Pls. 2,3) except 4 varied forms indicated in the previous paper (1990). In view of facts stated above *B. hexaceras* appears to show wide variations in numbers of spines. Therefore, *B. hexaceras* needs redescribing number of spines. Also *Beania hexaceras* needs studying continually to clarify that this species from the Yellow Sea and the Sea of Japan shows the variations as well.

25. Beania mirabilis Johnston, 1846　줄콩이끼벌레

Material examined: Chijukdo, July 2, 1991, worm casts.

Remarks: Our specimens have no spine or 2-4 pairs of very small spines.

26. Beania vegae Silén, 1941　강장콩이끼벌레

Material examined: Ch'ŏngsando (100m deep), July 26, 1991, rocks; Manjaedo (20m deep), Aug. 23, 1988 (J.K. Jae).

27. *Beania discodermiae* (Ortmann, 1890) 두껍질콩이끼벌레

Material examined: Chikkudo (5m deep), July 22, 1990 (J.W. Lee)

Suborder Ascophora Levinsen, 1909 유낭 아목

Family Umbonulidae Canu & Bassler, 1935 방패이끼벌레 과

Genus *Hippomenella* Canu & Bassler, 1917 말달이끼벌레 속

28. *Hippomenella spatulata* Harmer, 1957 스푼이끼벌레

Material examined: Sŏgwip'o, July 13, 1979 (H.K. Kim).

Family Exochellidae Bassler, 1935 우뚝이끼벌레 과

Genus *Escharoides* Milne-Edwards, 1836 혀이끼벌레 속

29. *Escharoides sauroglossa* Levinsen, 1909 뱀혀이끼벌레

Material examined: Mip'o, July 15 (B.J. Rho); Dec. 9, 1974 (B.J. Rho); Sŏgwip'o July 13, 1979 (H.K. Kim); Ch'ŏngsando, July 25, 1981; Mip'o, Dec. 10, 1981; Cheju-hang June 21, 1985; Ch'ujado, Feb. 6, 1986; Pijindo, May 31, 1987 (J.K. Jae); Kwantaldo (5m deep), Aug. 19, 1988 (J.K. Jae)

30. *Escharoides excavata* (MacGill., 1860) 난로이끼벌레

Material examined: Sŏgwip'o, Aug. 3, 1970 (B.J. Rho); Sŏgwip'o, Oct. 19, 1973 (B.J. Rho); Orukto, April 8, 1976 (B.J. Rho), seaweeds; Sangju-ri, July 29, 1980 (J.I. Song); Kŏmundo (15m deep), July 25, 1988 (B.J. Rho), seaweeds; Kŏmodo, July 31, 1988 (J.W. Lee); Mijo-ri (intertidal), April 27, 1990 (J.I. Song), shell; Pongnam, July 1, 1991, rocks.

Remarks: The specimens from Sŏgwip'o have five spines, one avicularium and no cardelle.

Family Celleporariidae Harmer, 1957 섬유이끼벌레 과

Genus *Celleporaria* Lamouroux, 1821 섬유이끼벌레 속

31. *Celleporaria wakayamensis* (Okada & Mawatari, 1938) 섬유이끼벌레

Material examined: Sangju-ri, May 23, 1981; Mosŭlp'o, July 14, 1987, seaweeds.

Remarks: We could not find the spine in the specimens from Mosŭlp'o.

Family Petraliellidae Harmer, 1957 잎이끼벌레 과

Genus *Hippopetraliella* Stach, 1936 말잎이끼벌레 속

32. *Hippopetraliella magna* (d'Orbigny, 1852) 큰말잎이끼벌레

Material examined: Mip'o, July 15, 1974 (B.J. Rho); Munsŏm, Dec. 3, 1978 (B.J. Rho); Pŏmsŏm, May 21, 1982 (J.I. Song); Sŏgwip'o, May 22, 1982 (J.I. Song); Taep'o Jan. 16, 1985; Supsŏm (10m deep), July 14, 1987 (J.W. Lee), sponges, anthozoans, seaweeds; Kwantaldo (15m deep), Aug. 19, 1988 (J.K. Jae); Pŏmsŏm, Oct. 22, 1991 (J.I. Song).

Genus *Mucropetraliella* Stach, 1936 잎이끼벌레 속

33. ***Mucropetraliella mucroaviculata*** (Okada & Mawatari, 1938) 조두체잎이끼벌레

Material examined: Pŏmsŏm, May 21, 1982 (J.I. Song); Jan. 17, 1985.

Genus *Sinupetraliella* Stach, 1936 굽은잎이끼벌레 속

*34. ***Sinupetraliella gigantea*** (Canu & Bassler, 1929) 큰굽은잎이끼벌레 (신칭) (Pl. 4)

Petraliella gigantea Canu & Bassler, 1929, p.258, pl.23, figs.10,11.

Sinupetraliella gigantea: Harmer, 1957, pp.706-708, pl.45, figs. 16,17, text-fig. 62, A,C.

Material examined: Mip'o, July 15, 1974 (B.J. Rho); Chejuhang, June 25, 1985.

Description: Colony encrusting. Zooecia large, a little convex, with pores on the frontal wall. Orifice nearly circular, with a wide unilateral sinus limited medianly by a cornical projection formed by the small suboral avicularium. A lyrula with 3 denticles, on the basal side of the avicularium. Lateral oral avicularium rounded, one or none, at the distal end of the orifice.

Distribution: Korea (South Sea); Philippine; Sulu Archipelago; Weigeu Islands; Sibutu Islands; Darvel Bay.

Family Savignyellidae Levinsen, 1909 사비그니이끼벌레 과
Genus *Halysisis* Norman, 1909 사슬이끼벌레 속

35. ***Halysisis ijimai*** (Okada, 1921) 사슬이끼벌레

Material examined: Mip'o, April 25, 1975; Ch'ŏngsando, July 25, 1981 (J.I. Song); Sŏgwip'o, May 22, 1982 (J.I. Song); Mosŭlp'o, June 18, 1985 (B.J. Rho).

Family Vittaticellidae Harmer, 1957 미끈이이끼벌레 과
Genus *Vittaticella* Maplestome, 1900 미끈이이끼벌레 속

36. ***Vittaticella elegans*** (Busk, 1852) 미끈이이끼벌레

Material examined: Sŏgwip'o, July 13, 1979 (H.K. Kim); Pŏmsŏm, May 21, 1982 (J.I. Song); Sŏgwip'o, May 22, 1982 (J.I. Song): Kap'ado, Jan. 16, 1985 (H.S. Kim); Pŏmsŏm, Jan. 17, 1985; Kap'ado, June 6, 1985 (B.J. Rho); P'yosŏn, Oct. 9, 1985; Kwantaldo (25m deep), Aug. 19, 1988 (J.K. Jae); Pŏmsŏm, Oct. 22, 1991 (J.I. Song), shell; Ch'agwido, Oct. 23, 1991 (J.I. Song), seaweeds.

Family Watersiporidae Vigneaux, 1949 물구멍이끼벌레 과
Genus ***Watersipora*** Neviani, 1895 물구멍이끼벌레 속

37. ***Watersipora subovoidea*** (d'Orbigny, 1852) 자주빛이끼벌레

Material examined: Sangju-ri, June 6, 1974 (B.J. Rho); Orukto, April 18, 1976 (B.J. Rho), other bryozoans; Mijo-ri, Aug. 1, 1980 (J.I. Song); Sangju-ri, Nov. 15, 1980 (J.I. Song), sponges; Pogildo, July 21, 1981; Chukjŏng, July 23, 1982 (J.I. Song); Sinsudo, July 21, 1984, seaweeds; Taep'o, Jan. 16, 1985;

Supsŏm (10m deep), July 14, 1987, debris; Annorudo, July 24, 1988 (B.J. Rho), sponges, shell; Sorido (subtidal), Aug. 31, 1988 (J.K. Jae), seaweeds; Mijo-ri, April, 27, 1990 (B.J. Rho), seaweeds; Nodo, April 27, 1990 (B.J. Rho), shell; Hoenggando, July 23, 1990 (J.W. Lee); Naebal, June 30, 1991, ascidians; Pongnam, July 1, 1991, rocks; Chukjŏng, July 1, 1991, seaweeds; Chijukkto, July 2, 1991, seaweeds.

38. *Watersipora arcuata* Banta, 1969 만곡이끼벌레

Material examined: Sŏgwip'o, July 10, 1965 (B.J. Rho); July 11, 1965 (B.J. Rho); Dec. 8, 1972 (B.J. Rho); July 13, 1979 (H.K. Kim); Pŏmsŏm, May 21, 1982 (J.I. Song); Jan. 17, 1985; Sammaebong, Jan. 18, 1985.

Family Cryptosulidae Vigneaux, 1949 숨은이끼벌레 과 (신칭)
Genus *Cryptosula* Canu & Bassler, 1925 숨은이끼벌레 속 (신칭)

39. *Cryptosula pallasiana (Moll, 1803) 숨은이끼벌레 (신칭) (Pl. 1, Fig. 5)

Hippodiplosia pallasiana: Okada, 1929, pp. 25, 26, pl. 2, fig. 4, pl. 5, fig. 1; Mawatari, 1952, p. 265.

Lepralia pallasiana: Borg, 1930, p.93, fig. 111.

Cryptosula pallasiana: Pratt, 1935, p.301; Marcus, 1950, p.20; Brown, 1952. pp.274, 275, fig. 205; Osburn, 1952, pp. 470, 471, pl. 57, figs. 4,5; Maturo, 1957, p.58, fig. 64; Ryland, 1962, p.13, fig. 13E; Rogick, 1964, p.178; Pinter, 1969, p.209; Soule, Soule & Pinter, 1975, p.598, fig. 64; Lacourt, 1978, p.5, fig. 11; Hayward & Ryland, 1979, pp. 90, 91, fig. 30; Bergy & Denning, 1987, p. 437.

Material examined: Nodo, April 27, 1990 (B.J. Rho), shell.

Description: Colony encrusting, orange in color. Zooecia moderately large, broad oval to hexagonal. Frontal wall coarse with large pores. Orifice large, longer; distal border arcuate, sides constricted in the lower middle, proximal lip convex, forming bell-shape, with small cardelles. Operculum well chitinized, with a narrow sclerite scarcely seperated from the lateral border. Suboral umbonate process, small and median.

Distribution: Korea (South Sea); Japan; California; Nova Scotia to Florida; England; Netherland; Denmark; Caribbean Sea; Moroco; Portugal; France; Alasca.

Family Hippopodinidae Levinsen, 1909 말발이끼벌레 과
Genus *Cheiloporina* Canu & Bassler, 1923 입술구멍이끼벌레 속

40. *Cheiloporina haddoni* (Harmer, 1902) 하돈입술구멍이끼벌레

Material examined: Pŏmsŏm, Jan. 17, 1985.

Genus *Hippopodina* Levinsen, 1909 말발이끼벌레 속 (신칭)

41. *Hippopodina feegeensis (Busk, 1884) 말발이끼벌레 (신칭) (Pl.1, Figs. 6,7)

Lepralia feegeensis Busk, 1884, pp.144, 145, pl.22, fig. 9.

Hippopodina feegeensis: Osburn, 1952, pp. 292, 293, pl. 31, figs. 6-8; Mawatari, 1952, p. 265; Brown, 1952, pp. 275-277, fig. 206; Harmer, 1957, pp. 974-976, pl. 67, figs. 7-9; Soule & Duff, 1957, pp. 107, 108; Powell, 1967, pp. 169,170, pl. 2, fig. 1.

Material examined: Ch'ujado, May 25, 1987 (J.K. Jae), shell.

Description: Colony encrusting, thin. Zooecia oblong, alternate, with small numerous pores. Orifice large, rounded distally, slightly constricted in the lower middle of sides and middle of proximal lip, with cardelles. Operculum chitinized, with elongate sclerites near to the lateral border. Avicularia beside and above the orifice, long triangular, directed inwards.

Distribution: Korea (South Sea); California; Hong Kong; Philippine; Singapore; South Pacific Ocean; Florida to Brazil; Red Sea; Celon.

Family Eurystomellidae Levinsen, 1909 유리스토멜라 과 (신칭)
Genus *Eurystomella* Levinsen, 1909 유리스토멜라 속 (신칭)

42. *Eurystomella bilabiata (Hincks, 1884) 두입술유리스토멜라이끼벌레 (신칭) (Pl. 1. Fig. 8)

Lepralia bilabiata: Robertson, 1908, p. 298, pl. 21, figs. 61-64; Okada, 1929, pp.24, 25, pl.2, fig. 3, text-fig. 10.

Eurystomella bilabiata: Osburn, 1952, p. 398, pl. 58, fig. 5; Mawatari, 1952, p. 280; Soule & Duff, 1957, p. 118; Soule, Soule & Pinter, 1975, p. 599, fig. 72; Bergy & Denning, 1987, p. 438, fig. 21. 64.

Material examined: Mip'o, June 22, 1985 (B.J. Rho), shell.

Description: Colony encrusting in a single layer, reddish in color. Zooecia hexagonal, narrowed and truncate at the proximal end. Frontal wall smooth without pores. Orifice shaped like a hat, rounded distally, suddenly wider near the proximal border which is nearly straight. On the front from the middle sides of the orifice to a little under sides of the orifice, there are membranous arcuate area.

Remarks: In our specimens the author could not find the frontal low umbo observed in specimens of Japan and the Pacific Ocean.

Distribution: Korea (South Sea); Japan; California; British Colombia; Van Couver; Mexico.

Family Escharellidae Levinsen, 1909 빗이끼벌레 과
Genus *Mucronella* Hincks, 1880 침이끼벌레 속

43. *Mucronella perforata* Okada & Mawatari, 1937 구멍침이끼벌레

Material examined: Sangju-ri, Nov. 15, 1980 (J.I. Song), shell.

Family Schizoporellidae Jullien, 1903 구멍이끼벌레 과
Genus *Schizoporella* Hincks, 1887 구멍이끼벌레 속

44. *Schizoporella unicornis* (Johnston, 1847) 한구멍이끼벌레

Material examined: Noktong, June 29, 1991, shell; Pongnam, July 1, 1991, rocks.

45. *Schizoporella nivea* Busk, 1884 구멍이끼벌레

Material examined: Hoenggando (15m deep), July 23, 1990 (J.W. Lee), rocks.

Genus *Arthropoma* Levinsen, 1909 관절이끼벌레 속

46. Arthropoma cecilii (Audouin, 1826) 관절이끼벌레

Material examined: Ch'ujado (10m deep), May 26, 1987 (J.K. Jae), other bryozoans.

Genus *Buffonellaria* Canu & Bassler, 1917 두꺼비이끼벌레 속

47. Buffonellaria divergens (Smitt, 1873) 퍼진두꺼비이끼벌레

Material examined; Ch'ujado (20m deep), May 26, 1987 (J.K. Jae).

Genus *Calyptotheca* Harmer, 1957 은협이끼벌레 속

48. Calyptotheca wasiensis Waters, 1909 은협이끼벌레

Material examined: Sangch'ujado (15m deep), July 22, 1990 (J.W. Lee), sponges.

49. Calyptotheca symmetrica (Ortmann, 1890) 상칭은협이끼벌레

Material examined: Supsŏm (10m deep), July 14, 1987 (J.W. Lee), debris.

Family Microporellidae Hincks, 1880 소공이끼벌레 과
Genus *Microporella* Hincks, 1877 소공이끼벌레 속

50. Microporella cribrosa Osburn, 1952 체이끼벌레

Material examined: Mijo-ri, Aug. 1, 1980 (J.I. Song), seaweeds; Chijukto, July 2, 1991, seaweeds, shell.

Genus *Fenestrulina* Jullien, 1888 방사이끼벌레 속

51. Fenestrulina malusii (Audouin, 1826) 방사이끼벌레

Material examined: Manjaedo (20m deep), Aug. 23, 1988 (J.K. Jae); Ch'ujado (20m deep), May 26, 1987 (J.K. Jae), rocks.

52. Fenestrulina mutabilis (Hastings, 1932) 변이방사이끼벌레

Material examined; Sangju-ri, July 29, 1980 (J.I. Song), debris; Kŏmundo, July 20, 1982; Maemuldo, July 18, 1984; Hodo, July 19, 1984; Kimyŏng (20m deep), July 15, 1991 (C.J. Sim), debris; Samyang 1 dong (40m deep), Aug. 6, 1991 (C.J. Sim).

Family Adeonellidae 아데오넬라 과
Genus *Adeonella* Busk, 1884 아데오넬라 속

53. Adeonella polymorpha Busk, 1884 다형이끼벌레

Material examined: Pŏmsŏm, Oct. 22, 1991 (J.I. Song); Ch'agwido, Oct. 23, 1991 (J.I. Song), seaweeds.

Family Reteporidae Smitt, 1867 망이끼벌레 과
Genus *Iodictyum* Harmer, 1933 빨간망이끼벌레 속

54. *Iodictyum axillare* (Ortmann, 1890) 빨간망이끼벌레

Material examined: Mip'o, July 15, 1974 (B.J. Rho); Kŏmodo, Aug. 5, 1983 (J.I. Song).

Genus *Phidolopora* Gabb & Horn, 1862 연구멍이끼벌레 속

55. *Phidolopora pacifica* (Robertson, 1908) 태양연구멍이끼벌레

Material examined: Samch'ŏnp'o, July 21, 1984 (J.W. Lee); Manjaedo (20m deep), Aug 23, 1988 (J.K, Jae).

Family Celleporidae Busk, 1852 가지이끼벌레 과
Genus *Celleporina* Gray, 1848 가지이끼벌레 속

56. *Celleporina geminata* (Ortmann, 1890) 가지이끼벌레

Material examined: Manjaedo (20m deep). Aug. 23, 1988 (J.K. Jae); Ch'agwido, Oct. 23, 1991 (J.I. Song), seaweeds

57. *Celleporina porosissima* (Okada, 1923) 포로시씨마가지이끼벌레

Material examined: Yejakdo, July 23, 1981, seaweeds; Manjaedo (20m deep), Aug. 23, 1988 (J.K. Jae); Yŏsŏdo (5m deep), Aug. 25, 1988 (J.K. Jae), seaweeds; Yokjido (10m deep), Sep. 1, 1988 (J.K. Jae), seaweeds.

ABSTRACT

The systematic study on the bryozoans from the South Sea in Korea was done with the materials collected at 49 localities from 1965 to 1991. As a result, 57 species in two suborders of cheilostomatous bryozoans were identified, of which seven species, *Electra tenella, Labioporella bursaria, Dendrobeania longispinosa, Sinupetraliella gigantea, Cryptosula pallasiana, Hippopodina feegeensis* and *Eurystomella bilabiata* were new to Korean fauna. The unrecorded species and the species which need remarking were described with plates.

ACKNOWLEDGEMENTS

The author thanks Dr. Boon Jo Rho and Dr. Jun Im Song, Department of Biological Sciences, Ewha Womans University for the presentation of the materials valuable for this study.

REFERENCES

Bergy, A. and D. Denning, 1987. Marine invertebrates of the Pacific northwest 21. Phylum (Moss Animal). Univ. Arizona

Press, Tuison, Arizona, pp. 356-596.

Borg, F., 1930. Moostierchen oder Bryozoen (Ectoprocten). Verlag von Gustas Fischer Jena, pp. 27-142.

Brown, D. A., 1952. The Tertiary Cheilostomatous Polyzoa of New Zealand. Brit. Mus. (Nat. Hist.), pp. 1-405.

Busk, G., 1884. Report on the Polyzoa collected by H.M.S. Challenger during the years 1873-76, part I. the Cheilostomata. Zool. Chall. Exp., part **30:** 1-216.

Canu, F. and R. S. Bassler, 1929. Bryozoa of the Philippine region. Smithsonian Institution United States National Museum, Bulletin 100, **9:** 1-685.

Harmer, S. F., 1926. The Polyzoa of the Siboga Expedition part II. Cheilostomata-Anasca. Siboga-Expeditie, **28b:** 181-480.

Harmer, S. F., 1957. Polyzoa of the Siboga Expedition part IV. Cheilostomata-Ascophora II. Siboga-Expeditie, **28d:** 641-1147.

Hayward, P. J. and J. S. Ryland, 1979. British Ascophoran Bryozoans. Academic Press, London, New York, San Francisco, **14:** 1-312.

Lacourt, A. W., 1978. De Nederlandse Marine Mosdiertjes-Bryozoa-(Ectoprocta, Gymnolaemata). Wetenschappelijke Mededelingen van de Koninkijke Nederlandse Natuurhistorisce Vereniging, (129): 1-21.

Marcus, E., 1937. Papers from Dr. Th. Mortensen's Pacific Expedition 1914-16, 69. Bryozoen von St. Helena. Vidensk. Medd. fra Dansk naturh Foren., **101:** 183-252.

Marcus, E., 1950. Systematic Remarks on the Bryozoan Fauna of Denmark. Vidensk. Medd. fra Dansk naturh Foren., **112:** 1-34.

Maturo, F. S. Jr., 1957. A Study of the Bryozoa of Beaufort, North Carolina and Vicinity. J. Elisha Mitchell Sci. Soc., **73** (1): 11-68.

Mawatari, S., 1952. Bryozoa of Kii Peninsula. Sato Mar. Bio. Lab., **2** (2): 261-288.

Okada, Y., 1923. On a Collection of Bryozoa from the Straits of Corea. Ann. Zool. Jap., **10** (22): 215-234.

Okada, Y., 1929. Report of the Biological Survey of Mutsu Bay 12. Cheilostomatous Bryozoa of Mutsu Bay. Sci. Rep. Tohoku Imp. Univ., ser. 4, Biology, **4** (1): 11-35.

Okada, Y. and S. F. Mawatari, 1938. On the collection of Bryozoa along the coast of Wakayama-ken, the Middle Part of Honsyu, Japan. Ann. Zool. Jap., **17** (3,4); 445-462.

Osburn, R. C., 1947. Bryozoa of the Allan Hancock Atlantic Expedition, 1939. Allan Hancock Expedition, (5): 1-66.

Osburn, R. C., 1950. Bryozoa of the Pacific Coast of America part I. Cheilostomata-Anasca. Allan Hancock Pacific Coast of America, **14** (1): 1-191.

Osburn, R. C., 1952. Bryozoa of the Pacific Coast of America part II. Cheilostomata-Ascophora. Allan Hancock Pacific Expedition, **14** (2): 271-518.

Pinter, P., 1969. Bryozoan-Algal Association in Southern California Waters. Bull. So. Calif. Acad. Sci., **69** (4): 199-217.

Powell, N. A., 1967. Bryozoa (Polyzoa) from the South Red Sea. Extrait des Cahiers de Biologie Marine, **VIII:** 167-183.

Pratt, H. S., 1935. A Manual of the Common Invertebrate Animals (Exclusive of Insects), Phylum IX. Bryozoa MaGraw-Hill Book Company, New York, Toronto, London, pp. 286-309.

Rho, B. J. and H. B. Chung, 1975. A Taxonomic Study on the marine Bryozoans in Korea. Jour. Kor. Res. Inst. Bet. Liv., **14:** 47-62.

Rho, B. J. and H. K. Kim, 1981. A Study on the Marine Bryozoans in Korea 3. Stenolaemata and Gymnolaemata. Jour. Kor. Res. Inst. Bet. Liv., **27:** 57-80.

Rho, B. J. and J. E. Seo, 1984. A Systematic Study on the Marine Bryozoans in Korea 4. Jour. Kor. Res. Inst. Bet. Liv. **33:** 73-98.

Rho, B. J. and J. E. Seo, 1985. A Systematic Study on the Marine Bryozoans in Korea 5. Jour. Kor. Res. Inst. Bet. Liv., **35:** 53-68.

Rho, B. J. and J. E. Seo, 1986. A Systematic Study on the Marine Bryozoans in Cheju-do, Kor. Jour. Zool., **29** (1): 31-60.

Rho, B. J. and J. E. Seo, 1988. On New species, *Codonellina parviaviculata* sp. nov. an Ascophoran Bryozoa from the Yellow Sea in Korea. Korean J. Syst, Zool. special issue No. **2:** 37-42.

Rho, B. J. and J. E. Seo, 1990. A Systematic Study on the Marine Bryozoans in Korea 7. Suborder Anasca. Korea J. Syst. Zool., **6** (1): 145-160.

Rho, B. J. and J. I. Song, 1980. A Systematic Study on the Marine Bryozoans in Korea 2. Anascan Cheilostomata. Commem. Papers Prof. C.-W. Kim's 60th Birth Anniv., 147-162.

Robertson, A., 1905. Non-Incrusting Cheilostomatous Bryozoa of the West Coast of North America. Univ. Calif. Publ. Zool., **2** (5): 235-322.

Robertson, A., 1908. The Incrusting Cheilostomatous Bryozoa of the West Coast of North America. Univ. Calif. Publ. Zool., **4** (15): 253-344.

Rogick, M. D., 1964. Keys to Marine Invertebrates of the Woods Hole Region, Chapter 17. Phylum Ectoprocta. Contribution no. 11. Systematics-Ecology Program. Marine Biological Laboratory Woods Hole, Messachusettes, pp. 167-187.

Ryland, J. S., 1962. Biology and Identification of Intertidal Polyzoa, Field Studies, **1** (4): 33-51.

Seo, J. E. and B. J. Rho, 1989. A Systematic Study on the Marine Bryozoans in Korea 6. Ascophora. Korean J. Syst. Zool. **5** (2): 205-223.

Silén, L., 1941. Cheilostomata Anasca (Bryozoa) Collected by Prof. Dr. Sisten Bock's Expedition to Japan and the Bonin Island, 1914. Arkiv för Zool., **33** (A): 1-130.

Song, J. I., 1985, Studies on the fouling Animals in Wŏlsŏng and Sŏch'ŏn. Jour. Kor. Res. Inst. Bet. Liv. **36:** 69-78.

Soule, J. D., 1959. Results of the Puritan-American Museum of Natural History Expedition to Western Mexico 6. Anascan Cheilostomata (Bryozoa) of the Gulf of California. Amer. Mus. Novitates, (1969): 1-54.

Soule, J. D. and M. M. Duff, 1957. Fossil Bryozoa from the Pleistocene of Southern California. Proc. Calif. Acad. Sci., fourth series, **24** (4): 87-146.

Soule, J. D., D. F. Soule and P. A. Pinter, 1975. Light's Manual Intertidal Invertebrates of the Central California Coast, Phylum Ectoproct (Bryozoa). Univ. Calif. Press, pp. 579-608.

RECEIVED: 6 APRIL 1992
ACCEPTED: 2 MAY 1992

EXPLANATION OF PLATES 1-4

Plate 1

Fig. 1. Zooids of *Electra tenella* (Hincks, 1880) SEM × 140
Fig. 2. Zooids of *Labioporella bursaria* (MacGill., 1879) LM × 25
Fig. 3. Mandible of *Labioporella bursaria* (MacGill., 1879) LM × 81
Fig. 4. Zooids of *Dendrobeania longispinosa* (Robertson, 1905) LM × 40
Fig. 5. Zooids of *Cryptosula pallasiana* (Moll, 1803) LM × 101
Fig. 6. Zooids of *Hippopodina feegeensis* (Busk, 1884) LM × 25
Fig. 7. Orifice of *Hippopodina feegeensis* (Busk, 1884) LM × 101
Fig. 8. Zooids of *Eurystomella bilabiata* (Hincks, 1884) LM × 63

Plate 2

Beania hexaceras (Ortmann, 1890)
Figs. 1,2. Specimens from Hongdo LM × 50
Fig. 3. Specimens from Yokjido LM × 50
Fig. 4. Specimens from Kŏmundo (May 27, 1987) LM × 50
Figs. 5,6. Specimens from Kŏmundo (July 25, 1988) LM × 50
Figs. 7,8. Specimens from Kŏmundo (July 27, 1988) LM × 50

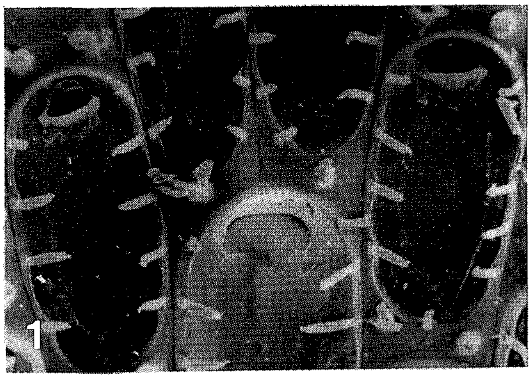
Plate 3

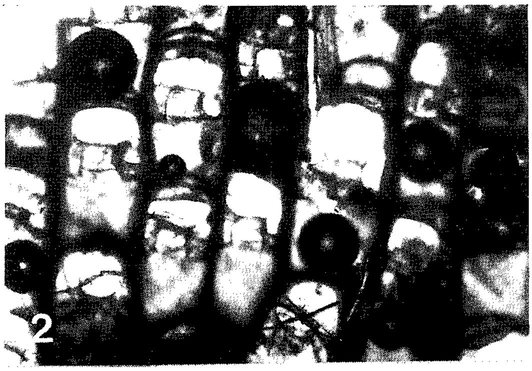
Beania hexaceras (Ortmann, 1890)
Fig. 1. Specimens from Yŏsŏdo LM × 50
Fig. 2. Specimens from Poronsŏm LM × 50
Figs. 3,4. Specimens from Hoenggando LM × 50
Figs. 5,6. Specimens from Sangch'ujado LM × 50
Figs. 7,8. Specimens from Kwantaldo LM × 50

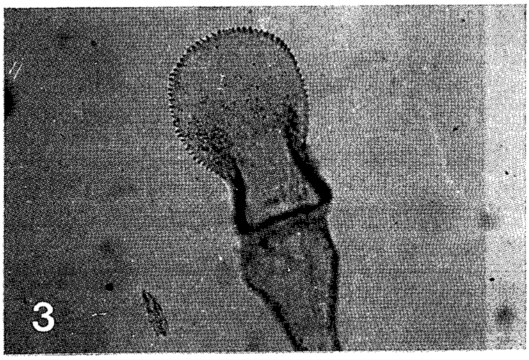
Plate 4

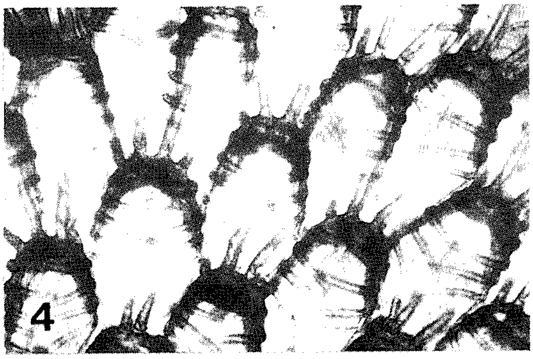
Sinupetraliella gigantea (Canu & Bassler, 1929)
Fig. 1. Arrows indicate oral avicularium.
Fig. 2. Orifice (or) with condyles (small arrow) and suboral avicularium (*). Sinus(s) is formed by denticles.

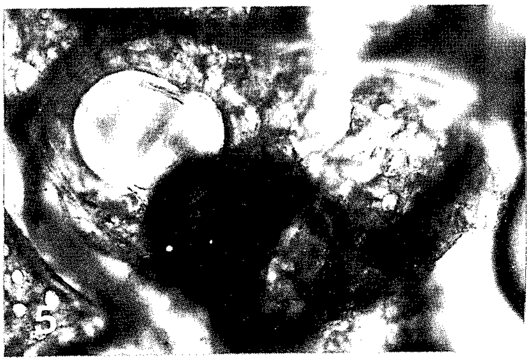
PLATE 1

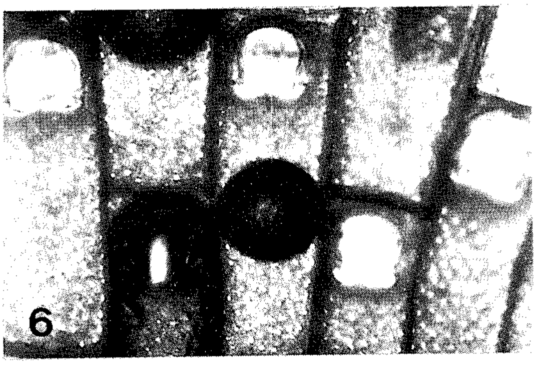


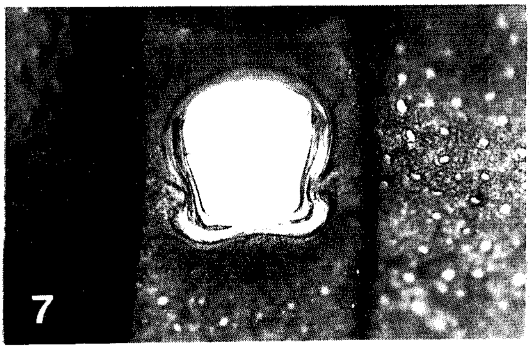












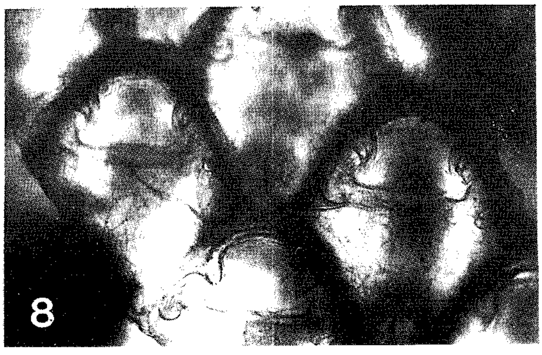
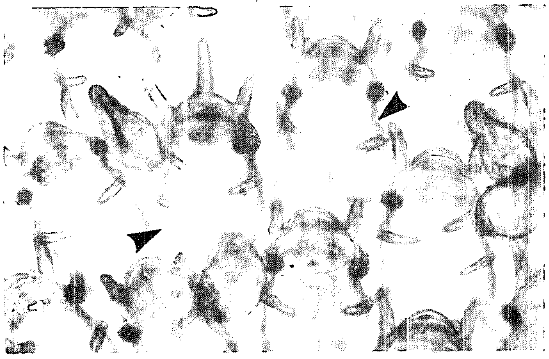
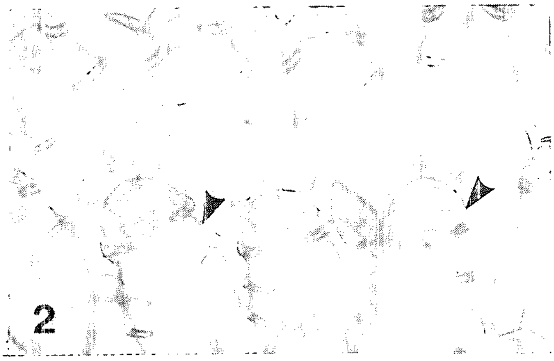
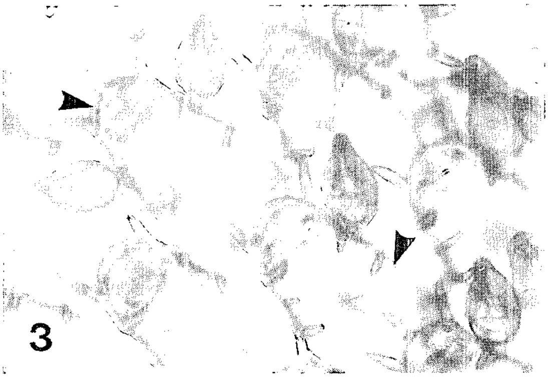


PLATE 2

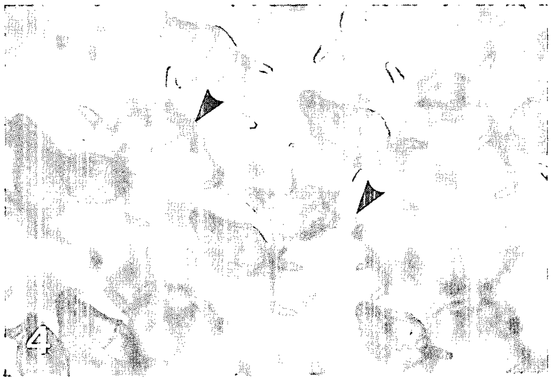




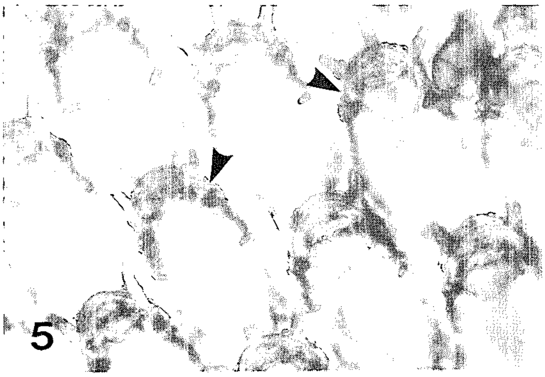
2



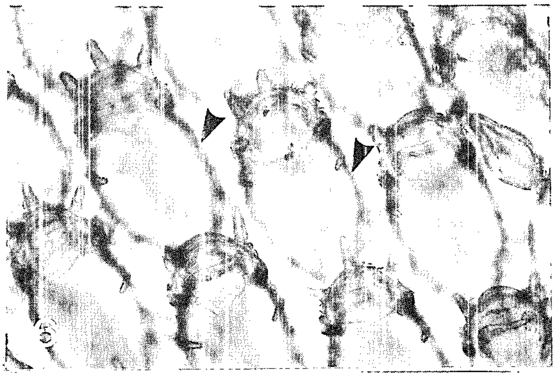
3



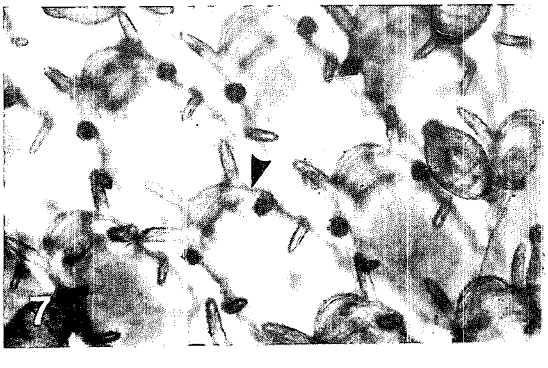
4



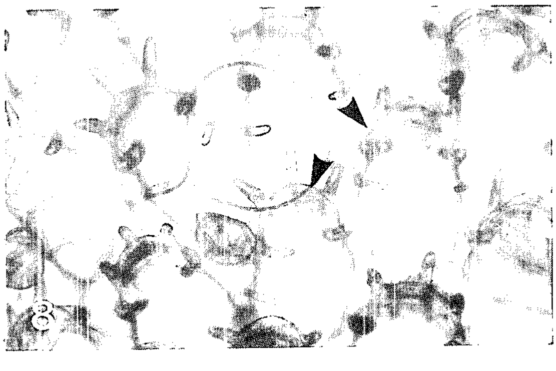
5



6

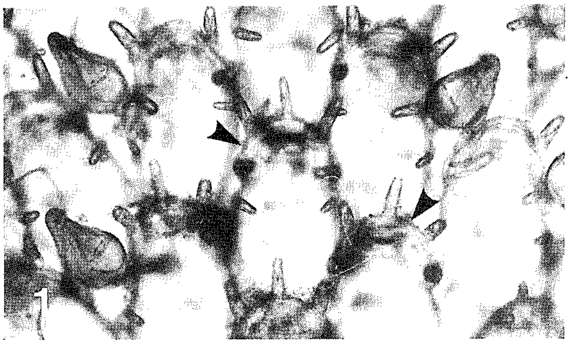


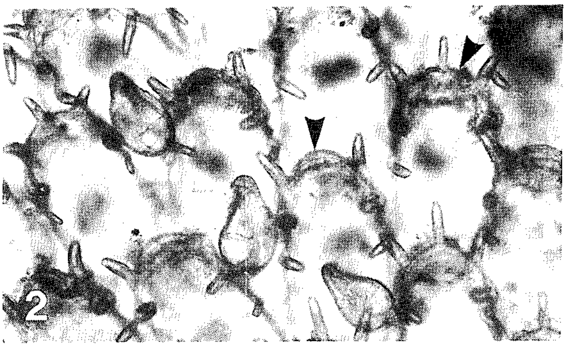
7

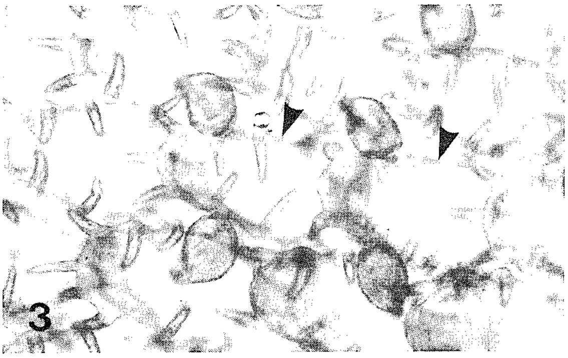


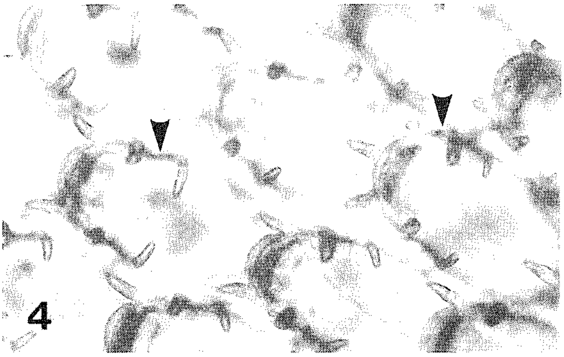
8

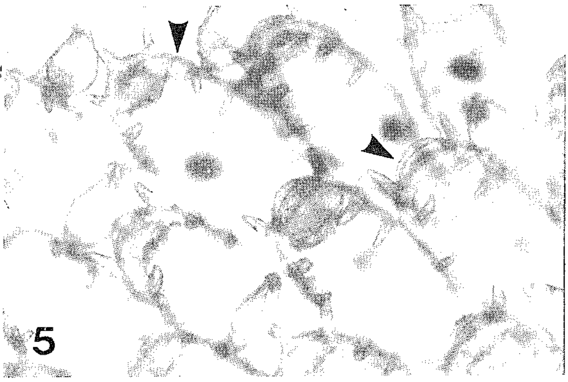
PLATE 3

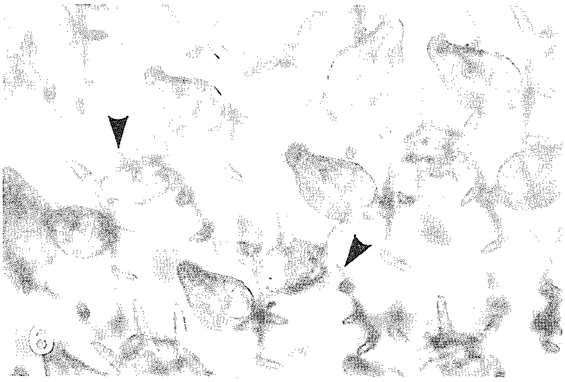

1

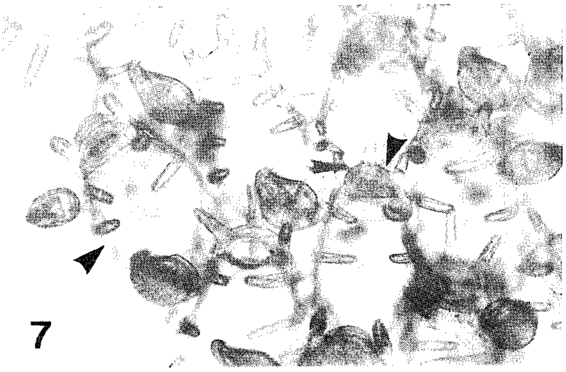

2


3


4


5


6


7

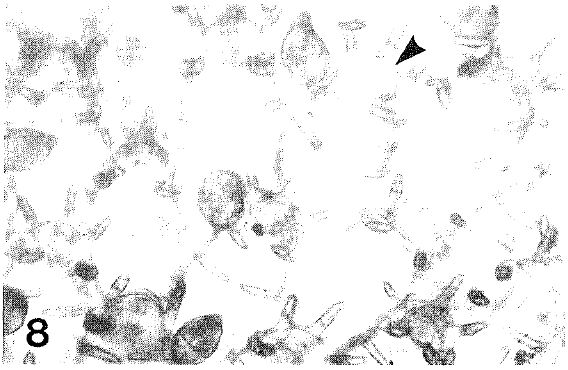

8

PLATE 4